



#9

## SEQUENCE LISTING

&lt;110&gt; UNITED BIOMEDICAL INC., ET AL.

&lt;120&gt; PEPTIDE COMPOSITION AS IMMUNOGEN FOR THE TREATMENT OF ALLERGY

&lt;130&gt; 11514153US1

&lt;140&gt; 09/701,623

&lt;141&gt; 2000-12-01

&lt;150&gt; RCT/US99/13959

&lt;151&gt; 1999-06-21

&lt;150&gt; 09/100,287

&lt;151&gt; 1998-06-20

&lt;160&gt; 91

&lt;170&gt; PatentIn Ver. 2.1

&lt;210&gt; 1

&lt;211&gt; 325

&lt;212&gt; PRT

&lt;213&gt; HUMAN

&lt;220&gt;

&lt;223&gt; CH2CH3 of human IgE

&lt;300&gt;

&lt;301&gt; Dorrington,

Bennich,

&lt;303&gt; Immunology

&lt;304&gt; 41

&lt;306&gt; 3-25

&lt;307&gt; 1978

&lt;400&gt; 1

Val Cys Ser Arg Asp Phe Thr Pro Pro Thr Val Lys Ile Leu Gln Ser  
1 5 10 15Ser Cys Asp Gly Gly His Phe Pro Pro Thr Ile Gln Leu Leu Cys  
20 25 30Leu Val Ser Gly Tyr Thr Pro Gly Thr Ile Asn Ile Thr Trp Leu Glu  
35 40 45

DRAFT

Asp Gly Gln Val Met Asp Val Asp Leu Ser Thr Ala Ser Thr Thr Gln  
50 55 60

Glu Gly Glu Leu Ala Ser Thr Gln Ser Glu Leu Thr Leu Ser Gln Lys  
65 70 75 80

His Trp Leu Ser Asp Arg Thr Tyr Thr Cys Gln Val Thr Tyr Gln Gly  
85 90 95

His Thr Phe Glu Asp Ser Thr Lys Lys Cys Ala Asp Ser Asn Pro Arg  
100 105 110

Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro Phe Asp Leu Phe Ile  
115 120 125

Arg Lys Ser Pro Thr Ile Thr Cys Leu Val Val Asp Leu Ala Pro Ser  
130 135 140

Lys Gly Thr Val Asn Leu Thr Trp Ser Arg Ala Ser Gly Lys Pro Val  
145 150 155 160

Asn His Ser Thr Arg Lys Glu Glu Lys Gln Arg Asn Gly Thr Leu Thr  
165 170 175

Val Thr Ser Thr Leu Pro Val Gly Thr Arg Asp Trp Ile Glu Gly Glu  
180 185 190

Thr Tyr Gln Cys Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met  
195 200 205

Arg Ser Thr Thr Lys Thr Ser Gly Pro Arg Ala Ala Pro Glu Val Tyr  
210 215 220

Ala Phe Ala Thr Pro Glu Trp Pro Gly Ser Arg Asp Lys Arg Thr Leu  
225 230 235 240

Ala Cys Leu Ile Gln Asn Phe Met Pro Glu Asp Ile Ser Val Gln Trp  
245 250 255

Leu His Asn Glu Val Gln Leu Pro Asp Ala Arg His Ser Thr Thr Gln  
260 265 270

Pro Arg Lys Thr Lys Gly Ser Gly Phe Phe Val Phe Ser Arg Leu Glu  
275 280 285

Val Thr Arg Ala Glu Trp Gln Glu Lys Asp Glu Phe Ile Cys Arg Ala  
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Val His Glu Ala Ala Ser Pro Ser Gln Thr Val Gln Arg Ala Val Ser  
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Val Asn Pro Gly Lys  
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<301> Patel,  
<303> Immunogenetics  
<304> 41  
<306> 282-286  
<307> 1995

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Ala Cys Ala Leu Asn Phe Ile Pro Pro Thr Val Lys Leu Phe His Ser  
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Ser Cys Asn Pro Val Gly Asp Thr His Thr Thr Ile Gln Leu Leu Cys  
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Leu Ile Ser Gly Tyr Val Pro Gly Asp Met Glu Val Ile Trp Leu Val  
35 40 45

Asp Gly Gln Lys Ala Thr Asn Ile Phe Pro Tyr Thr Ala Pro Gly Thr  
50 55 60

Lys Glu Gly Asn Val Thr Ser Thr His Ser Glu Leu Asn Ile Thr Gln  
65 70 75 80

Gly Glu Trp Val Ser Gln Lys Thr Tyr Thr Cys Gln Gly Phe Thr Phe  
85 90 95

Lys Asp Glu Ala Arg Lys Cys Ser Glu Ser Asp Pro Arg Gly Val Thr  
100 105 110

Ser Tyr Leu Ser Pro Pro Ser Pro Leu Asp Leu Tyr Val His Lys Ala  
115 120 125

Pro Lys Ile Thr Cys Leu Val Val Asp Leu Ala Thr Met Glu Gly Met

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135

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Asn Leu Thr Trp Tyr Arg Glu Ser Lys Glu Pro Val Asn Pro Gly Pro  
145 150 155 160

Leu Asn Lys Lys Asp His Phe Asn Gly Thr Ile Thr Val Thr Ser Thr  
165 170 175

Leu Pro Val Asn Thr Asn Asp Trp Ile Glu Gly Glu Thr Tyr Tyr Cys  
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Arg Val Thr His Pro His Leu Pro Lys Asp Ile Val Arg Ser Ile Ala  
195 200 205

Lys Ala Pro Gly Lys Arg Ala Pro Pro Asp Val Tyr Leu Phe Leu Pro  
210 215 220

Pro Glu Glu Glu Gln Gly Thr Lys Asp Arg Val Thr Leu Thr Cys Leu  
225 230 235 240

Ile Gln Asn Phe Phe Pro Ala Asp Ile Ser Val Gln Trp Leu Arg Asn  
245 250 255

Asp Ser Pro Ile Gln Thr Asp Gln Tyr Thr Thr Thr Gly Pro His Lys  
260 265 270

Val Ser Gly Ser Arg Pro Ala Phe Phe Ile Phe Ser Arg Leu Glu Val  
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Ser Arg Val Asp Trp Glu Gln Lys Asn Lys Phe Thr Cys Gln Val Val  
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His Glu Ala Leu Ser Gly Ser Arg  
305 310

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<212> PRT

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<223> CH2CH3 of rat IgE

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<301> Dorrington,  
Bennich,

<303> Immunology

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<304> 41  
<306> 3-25  
<307> 1978

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<301> Patel,  
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<304> 41  
<306> 282-286  
<307> 1995

<300>  
<301> Steen,  
<303> J. Mol. Biol.  
<304> 177  
<306> 19-32  
<307> 1984

<300>  
<301> Ishida,  
<303> EMBO J.  
<304> 1  
<306> 1117-1123  
<307> 1982

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Ala Arg Pro Val Asn Ile Thr Lys Pro Thr Val Asp Leu Leu His Ser  
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Ser Cys Asp Pro Asn Ala Phe His Ser Thr Ile Gln Leu Tyr Cys Phe  
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Val Tyr Gly His Ile Gln Asn Asp Val Ser Ile His Trp Leu Met Asp  
35 40 45

Asp Arg Lys Ile Tyr Asp Thr His Ala Gln Asn Val Leu Ile Lys Glu  
50 55 60

Glu Gly Lys Leu Ala Ser Thr Tyr Ser Arg Leu Asn Ile Thr Gln Gln  
65 70 75 80

Gln Trp Met Ser Glu Ser Thr Phe Thr Cys Lys Val Thr Ser Gln Gly  
85 90 95

Glu Asn Tyr Trp Ala His Thr Arg Arg Cys Ser Asp Asp Glu Pro Arg  
100 105 110

Gly Val Ile Thr Tyr Leu Ile Pro Pro Ser Pro Leu Asp Leu Tyr Glu

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Asn Gly Thr Pro Lys Leu Thr Cys Leu Val Leu Asp Leu Glu Ser Glu  
130 135 140

Glu Asn Ile Thr Val Thr Trp Val Arg Glu Arg Lys Lys Ser Ile Gly  
145 150 155 160

Ser Ala Ser Gln Arg Ser Thr Lys His His Asn Ala Thr Thr Ser Ile  
165 170 175

Thr Ser Ile Leu Pro Val Asp Ala Lys Asp Trp Ile Glu Gly Glu Gly  
180 185 190

Tyr Gln Cys Arg Val Asp His Pro His Phe Pro Lys Pro Ile Val Arg  
195 200 205

Ser Ile Thr Lys Ala Leu Gly Leu Arg Ser Ala Pro Glu Val Tyr Val  
210 215 220

Phe Leu Pro Pro Glu Glu Glu Lys Asn Lys Arg Thr Leu Thr Cys  
225 230 235 240

Leu Ile Gln Asn Phe Phe Pro Glu Asp Ile Ser Val Gln Trp Leu Gln  
245 250 255

Asp Ser Lys Leu Ile Pro Lys Ser Gln His Ser Thr Thr Pro Leu  
260 265 270

Lys Thr Asn Gly Ser Asn Gln Arg Phe Phe Ile Phe Ser Arg Leu Glu  
275 280 285

Val Thr Lys Ala Leu Trp Thr Gln Thr Lys Gln Phe Thr Cys Arg Val  
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Ile His Glu Ala Leu Arg Glu Pro Arg  
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Val Arg Pro Val Thr His Ser Leu Ser Pro Pro Trp Ser Tyr Ser Ile  
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His Arg Cys Asp Pro Asn Ala Phe His Ser Thr Ile Gln Leu Tyr Cys  
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Phe Ile Tyr Gly His Ile Leu Asn Asp Val Ser Val Ser Trp Leu Met  
35 40 45

Asp Asp Arg Glu Ile Thr Asp Thr Leu Ala Gln Thr Val Leu Ile Lys  
50 55 60

Glu Glu Gly Lys Leu Ala Ser Thr Cys Ser Lys Leu Asn Ile Thr Glu  
65 70 75 80

Gln Gln Trp Met Ser Glu Ser Thr Phe Thr Cys Arg Val Thr Ser Gln  
85 90 95

Gly Cys Asp Tyr Leu Ala His Thr Arg Arg Cys Pro Asp His Glu Pro  
100 105 110

Arg Gly Ala Ile Thr Tyr Leu Ile Pro Pro Ser Pro Leu Asp Leu Tyr  
115 120 125

Gln Asn Gly Ala Pro Lys Leu Thr Cys Leu Val Val Asp Leu Glu Ser  
130 135 140

Glu Lys Asn Val Asn Val Thr Trp Asn Gln Glu Lys Lys Thr Ser Val  
145 150 155 160

Ser Ala Ser Gln Trp Tyr Thr Lys His His Asn Asn Ala Thr Thr Ser  
165 170 175

Ile Thr Ser Ile Leu Pro Val Val Ala Lys Asp Trp Ile Glu Gly Tyr  
180 185 190

Gly Tyr Gln Cys Ile Val Asp Arg Pro Asp Phe Pro Lys Pro Ile Val  
195 200 205

Arg Ser Ile Thr Lys Thr Pro Gly Gln Arg Ser Ala Pro Glu Val Tyr  
210 215 220 225

Val Phe Pro Pro Pro Glu Glu Glu Ser Glu Asp Lys Arg Thr Leu Thr  
225 230 235 240

Cys Leu Ile Gln Asn Phe Phe Pro Glu Asp Ile Ser Val Gln Trp Leu  
245 250 255

Gly Asp Gly Lys Leu Ile Ser Asn Ser Gln His Ser Thr Thr Thr Pro  
260 265 270

Leu Lys Ser Asn Gly Asn Gln Gly Phe Phe Ile Phe Ser Arg Leu Glu  
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Val Ala Lys Thr Leu Trp Thr Gln Arg Lys Gln Phe Thr Cys Gln Val  
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Ile His Glu Ala Leu Gln Lys Pro Arg  
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Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro His Leu Pro Arg  
1 5 10 15

Ala Leu Met Arg Ser Thr Thr Lys Cys  
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Cys Gly Glu Thr Tyr Tyr Ser Arg Val Thr His Pro His Leu Pro Lys  
1 5 10 15

Asp Ile Val Arg Ser Ile Ala Lys Cys  
20 25

<210> 7

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**<223> Description of Artificial Sequence: peptide**

**<400> 7**

Cys Gly Glu Gly Tyr Gln Ser Arg Val Asp His Pro His Phe Pro Lys  
1 5 10 15

Pro Ile Val Arg Ser Ile Thr Lys Cys  
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**<213> Artificial Sequence**

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**<400> 8**

Cys Gly Tyr Gly Tyr Gln Ser Ile Val Asp Arg Pro Asp Phe Pro Lys  
1 5 10 15

Pro Ile Val Arg Ser Ile Thr Leu Cys  
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**<210> 9**

**<211> 18**

**<212> PRT**

**<213> Artificial Sequence**

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Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr  
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Ile Asp

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Xaa Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Xaa Glu Xaa Xaa  
1 5 10 15

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Ile Ser Xaa Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Xaa Glu Xaa  
1 5 10 15  
Xaa Leu Phe

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Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Lys Glu  
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Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala Thr Tyr Gln Phe  
1 5 10 15

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Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr  
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Ile Asp Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro  
20 25 30

His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
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Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala Thr Tyr Gln Phe  
1 5 10 15

Gly Gly Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr Ile Ile  
20 25 30

Thr Thr Ile Asp Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr  
35 40 45

His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
50 55 60

<210> 16  
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Pro Pro Xaa Pro Xaa Pro  
1 5

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Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Lys Glu Gly Gly Lys Lys  
1 5 10 15  
  
Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr Ile Asp  
20 25 30  
  
Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro His Leu  
35 40 45  
  
Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
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Ile Ser Ile Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Ile Glu Xaa  
1 5 10 15  
  
Ile Leu Phe Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His  
20 25 30  
  
Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
35 40 45

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Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala Thr Gln Phe Gly  
1 5 10 15

Gly Ile Ser Ile Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Ile Glu  
20 25 30

Xaa Ile Leu Phe Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr  
35 40 45

His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
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Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Lys Glu Gly Gly Ile Ser  
1 5 10 15

Ile Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Ile Glu Xaa Ile Leu  
20 25 30

Phe Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro His  
35 40 45

Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
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    1           5           10          15
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Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro His Leu Pro  
20 25 30

Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
35 40

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Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala Thr Tyr Gln Phe  
1 5 10 15

Gly Gly Xaa Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Xaa Glu Xaa  
20 25 30

Xaa Gly Gly Cys Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro His  
35 40 45

Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
50 55 60

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Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Lys Glu Gly Gly Xaa Xaa  
1 5 10 15

Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Xaa Glu Xaa Xaa Gly Gly Cys  
20 25 30

Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro His Leu Pro Arg Ala  
35 40 45

Leu Met Arg Ser Thr Thr Lys Cys  
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BIOLOGICAL SEQUENCES

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Ile Ser Ile Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Ile Glu Xaa  
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Ile Leu Phe Gly Gly Cys Gly Tyr Gly Tyr Gln Ser Ile Val Asp His  
20 25 30

Pro Asp Phe Pro Lys Pro Ile Val Arg Ser Ile Thr Lys Cys  
35 40 45

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Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr  
1 5 10 15

Ile Asp Gly Gly Cys Gly Tyr Gly Gln Ser Ile Val Asp His Pro  
20 25 30

Asp Phe Pro Lys Pro Ile Val Arg Ser Ile Thr Lys Cys  
35 40 45

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Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr Ile Ile Thr Thr  
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Ile Asp Gly Gly Cys Gly Glu Thr Tyr Tyr Ser Arg Val Thr His Pro  
20 25 30

His Leu Pro Lys Asp Ile Val Arg Ser Ile Ala Lys Cys  
35 40 45

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<221> MOD\_RES  
<222> (7)  
<223> K, L

<220>  
<221> MOD\_RES  
<222> (8)  
<223> G, R

<220>  
<221> MOD\_RES  
<222> (9)  
<223> V, T

<220>  
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<222> (10)  
<223> I, V

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<222> (14)  
<223> I, T

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<222> (15)  
<223> E, R

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<223> G, M

<220>  
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<222> (19)  
<223> F, T

<220>  
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<222> (20)

<223> G, M

<400> 27

Xaa Xaa Ile Ser Glu Ile Xaa Gly Val Xaa Val His Lys Xaa Xaa Xaa  
1 5 10 15

Ile Leu Xaa Xaa Gly Cys Gly Glu Thr Tyr Tyr Ser Arg Val Thr His  
20 25 30

Pro His Leu Pro Lys Asp Ile Val Arg Ser Ile Ala Lys Cys  
35 40 45

<210> 28

<211> 49

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 28

Cys Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro  
1 5 10 15

Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Ser Leu  
20 25 30

Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser  
35 40 45

Arg

<210> 29

<211> 60

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 29

Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Xaa Ala Asp Ser Asn  
1 5 10 15

Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro Phe Asp Leu  
20 25 30

Phe Ile Arg Lys Ser Pro Thr Ile Thr Ser Leu Val Val Asp Leu Ala  
35 40 45

Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser Arg  
50 55 60

<210> 30

<211> 64

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 30

Gln Val Thr Tyr Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys  
1 5 10 15

Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser  
20 25 30

Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Ser Leu Val  
35 40 45

Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser Arg  
50 55 60

<210> 31

<211> 76

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 31

Gln Lys His Trp Leu Ser Asp Arg Thr Tyr Thr Ser Gln Val Thr Tyr  
1 5 10 15

Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys Ala Asp Ser Asn

20                   25                   30  
Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro Phe Asp Leu  
35                   40                   45

Phe Ile Arg Lys Ser Pro Thr Ile Thr Ser Leu Val Val Asp Leu Ala  
50                   55                   60

Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser Arg  
65                   70                   75

<210> 32

<211> 35

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 32

Cys Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro  
1                   5                   10                   15

Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Ser Leu  
20                   25                   30

Val Val Asp

35

<210> 33

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 33

Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys Ala Asp Ser Asn  
1                   5                   10                   15

Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro Phe Asp Leu  
20                   25                   30

Phe Ile Arg Lys Ser Pro Thr Ile Thr Ser Leu Val Val Asp  
35                   40                   45

DRAFT

<210> 34  
<211> 50  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 34  
Gln Val Thr Tyr Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys  
1 5 10 15

Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser  
20 25 30

Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr Ser Leu Val  
35 40 45

Val Asp  
50

<210> 35  
<211> 62  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 35  
Gln Lys His Trp Leu Ser Asp Arg Thr Tyr Thr Ser Gln Val Thr Tyr  
1 5 10 15

Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys Ala Asp Ser Asn  
20 25 30

Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro Phe Asp Leu  
35 40 45

Phe Ile Arg Lys Ser Pro Thr Ile Thr Ser Leu Val Val Asp  
50 55 60

<210> 36  
<211> 29

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SERIALIZED  
INDEXED  
FILED

<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 36  
Cys Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro  
1 5 10 15

Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile  
20 25

<210> 37  
<211> 40  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 37  
Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys Ala Asp Ser Asn  
1 5 10 15

Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro Phe Asp Leu  
20 25 30

Phe Ile Arg Lys Ser Pro Thr Ile  
35 40

<210> 38  
<211> 44  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 38  
Gln Val Thr Tyr Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys  
1 5 10 15

Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser  
20 25 30

Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile  
35 40

<210> 39  
<211> 56  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 39  
Gln Lys His Trp Leu Ser Asp Arg Thr Tyr Thr Ser Gln Val Thr Tyr  
1 5 10 15

Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys Ala Asp Ser Asn  
20 25 30

Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro Phe Asp Leu  
35 40 45

Phe Ile Arg Lys Ser Pro Thr Ile  
50 55

<210> 40  
<211> 76  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 40  
Gln Lys His Trp Leu Ser Asp Arg Thr Tyr Thr Cys Gln Val Thr Tyr  
1 5 10 15

Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys Ala Asp Ser Asn  
20 25 30

Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro Phe Asp Leu  
35 40 45

Phe Ile Arg Lys Ser Pro Thr Ile Thr Cys Leu Val Val Asp Leu Ala  
50 55 60

Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser Arg

65

70

75

<210> 41  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 41  
Cys Lys Gln Arg Asn Gly Thr Leu Thr Cys  
1 5 10

<210> 42  
<211> 45  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 42  
Gln Lys His Trp Leu Ser Asp Arg Thr Tyr Thr Cys Gln Val Thr Tyr  
1 5 10 15

Gln Gly His Thr Phe Glu Asp Ser Thr Lys Lys Cys Ala Asp Ser Asn  
20 25 30

Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro Ser Pro  
35 40 45

<210> 43  
<211> 34  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 43  
Cys Pro Ser Lys Gly Thr Val Asn Leu Thr Trp Ser Arg Ala Ser Gly  
1 5 10 15

Lys Pro Val Asn His Ser Thr Arg Lys Glu Glu Lys Gln Arg Asn Gly

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20

25

30

Thr Cys

<210> 44  
<211> 33  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 44  
Cys Pro Val Gly Thr Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys  
1 5 10 15

Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr Thr  
20 25 30

Cys

<210> 45  
<211> 14  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 45  
Ser Thr Thr Lys Thr Ser Gly Pro Arg Ala Ala Pro Glu Val  
1 5 10

<210> 46  
<211> 14  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 46  
Cys Trp Ser Arg Ala Ser Gly Lys Pro Val Cys Asn His Ser

1

5

10

<210> 47  
<211> 19  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 47  
Cys Ser Arg Pro Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr  
1 5 10 15  
Ile Thr Cys

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<210> 48  
<211> 13  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 48  
Cys Val Gly Thr Arg Asp Trp Ile Glu Gly Glu Pro Cys  
1 5 10

<210> 49  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 49  
Cys Pro Pro Val Gly Thr Arg Asp Trp Ile Glu Gly Glu Pro Cys  
1 5 10 15

<210> 50  
<211> 16  
<212> PRT

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<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 50

Cys Lys Glu Glu Lys Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Cys  
1 5 10 15

<210> 51

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 51

Lys Glu Glu Lys Gln Arg Asn Gly  
1 5

<210> 52

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 52

Cys Trp Ser Arg Ala Ser Gly Lys Pro Val Cys  
1 5 10

<210> 53

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 53

Pro Thr Ile Thr Cys Leu Val Leu Asp Leu Ala Pro Ser Lys Gly Thr  
1 5 10 15

Val Asn Leu Thr Cys  
20

<210> 54  
<211> 16  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 54  
Pro Thr Ile Thr Cys Leu Val Leu Asp Leu Ala Pro Ser Lys Gly Thr  
1 5 10 15

<210> 55  
<211> 25  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 55  
Thr Ser Thr Leu Pro Val Gly Thr Arg Asp Trp Ile Glu Gly Glu Thr  
1 5 10 15

Tyr Gln Cys Arg Val Thr His Pro His  
20 25

<210> 56  
<211> 16  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 56  
Pro Thr Ile Thr Ser Leu Val Leu Cys Leu Ala Pro Ser Lys Gly Cys  
1 5 10 15

<210> 57  
<211> 23

<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 57  
Cys Val Asn Leu Thr Trp Ser Arg Ala Ser Gly Lys Pro Val Asn His  
1 5 10 15

Ser Thr Arg Lys Glu Glu Cys  
20

<210> 58  
<211> 53  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 58  
Cys Thr Trp Ser Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg  
1 5 10 15

Lys Glu Glu Lys Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu  
20 25 30

Pro Val Gly Thr Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln Cys Arg  
35 40 45

Val Thr His Pro His  
50

<210> 59  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 59  
Lys Thr Lys Gly Ser Gly Phe Phe Val Phe  
1 5 10

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<210> 60
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: peptide

<220>
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<222> (4)
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<220>
<221> MOD_RES
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<223> K, R

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<223> G, T

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<222> (12)
<223> H, T

<220>
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<222> (13)
<223> K, R

<220>
<221> MOD_RES
<222> (16)
<223> G, T

<400> 60
Ile Ser Ile Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Ile Glu Xaa
      1           5           10          15

Ile Leu Phe
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<210> 61

S E Q U E N C E

<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 61  
Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu Glu Gly Val  
1 5 10 15

<210> 62  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 62  
Gly Ile Leu Glu Ser Arg Gly Ile Lys Ala Arg Ile Thr His Val Asp  
1 5 10 15

Thr Glu Ser Tyr  
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<210> 63  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 63  
Lys Lys Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu  
1 5 10 15

Leu

<210> 64  
<211> 22  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 64  
Lys Lys Phe Asn Asn Phe Thr Val Ser Phe Trp Leu Arg Val Pro Lys  
1 5 10 15  
  
Val Ser Ala Ser His Leu  
20

<210> 65  
<211> 30  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 65  
Lys Lys Leu Arg Arg Leu Leu Tyr Met Ile Tyr Met Ser Gly Leu Ala  
1 5 10 15  
  
Val Arg Val His Val Ser Lys Glu Glu Gln Tyr Tyr Asp Tyr  
20 25 30

<210> 66  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 66  
Tyr Asp Pro Asn Tyr Leu Arg Thr Asp Ser Asp Lys Asp Arg Phe Leu  
1 5 10 15  
  
Gln Thr Met Val Lys Leu Phe Asn Arg Ile Lys  
20 25

<210> 67  
<211> 24  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 67  
Gly Ala Tyr Ala Arg Cys Pro Asn Gly Thr Arg Ala Leu Thr Val Ala  
1 5 10 15  
  
Glu Leu Arg Gly Asn Ala Glu Leu  
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<210> 68  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 68  
Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp  
1 5 10 15

<210> 69  
<211> 21  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 69  
Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala Tyr Arg Pro Pro  
1 5 10 15  
  
Asn Ala Pro Ile Leu  
20

<210> 70  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 70  
Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp Thr Ala Ser Ala  
1 5 10 15

Leu Tyr Arg Glu  
20

<210> 71  
<211> 20  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 71  
Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu Leu  
1 5 10 15

Met Thr Leu Ala  
20

<210> 72  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 72  
Trp Val Arg Asp Ile Ile Asp Asp Phe Thr Asn Glu Ser Ser Gln Lys  
1 5 10 15

Thr

<210> 73  
<211> 19  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 73  
Arg Ala Gly Arg Ala Ile Leu His Ile Pro Thr Arg Ile Arg Gln Gly  
1 5 10 15  
  
Leu Glu Arg

<210> 74  
<211> 21  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: peptide

<400> 74  
Ala Val Ala Glu Gly Thr Asp Arg Val Ile Glu Val Leu Gln Arg Ala  
1 5 10 15  
  
Gly Arg Ala Ile Leu  
20

<210> 75  
<211> 25  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: peptide

<400> 75  
Ala Leu Asn Ile Trp Asp Arg Phe Asp Val Phe Ser Thr Leu Gly Ala  
1 5 10 15  
  
Thr Ser Gly Tyr Leu Lys Gly Asn Ser  
20 25

<210> 76  
<211> 22  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: peptide

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<400> 76  
Asp Ser Glu Thr Ala Asp Asn Leu Glu Lys Thr Val Ala Ala Leu Ser  
1 5 10 15

Ile Leu Pro Gly His Gly  
20

<210> 77  
<211> 39  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 77  
Glu Glu Ile Val Ala Gln Ser Ile Ala Leu Ser Ser Leu Met Val Ala  
1 5 10 15  
  
Gln Ala Ile Pro Leu Val Gly Glu Leu Val Asp Ile Gly Phe Ala Ala  
20 25 30

Thr Asn Phe Val Glu Ser Cys  
35

<210> 78  
<211> 21  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 78  
Asp Ile Glu Lys Lys Ile Ala Lys Met Glu Lys Ala Ser Ser Val Phe  
1 5 10 15

Asn Val Val Asn Ser  
20

<210> 79  
<211> 17  
<212> PRT  
<213> Artificial Sequence

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<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 79  
Lys Trp Phe Lys Thr Asn Ala Pro Asn Gly Val Asp Glu Lys Ile Arg  
1 5 10 15

Ile

<210> 80  
<211> 14  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 80  
Gly Leu Gln Gly Lys Ile Ala Asp Ala Val Lys Ala Lys Gly  
1 5 10

<210> 81  
<211> 19  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: peptide  
  
<400> 81  
Gly Leu Ala Ala Gly Leu Val Gly Met Ala Ala Asp Ala Met Val Glu  
1 5 10 15  
  
Asp Val Asn

<210> 82  
<211> 20  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: peptide

<400> 82  
Ser Thr Glu Thr Gly Asn Gln His His Tyr Gln Thr Arg Val Val Ser  
1 5 10 15

Asn Ala Asn Lys  
20

<210> 83  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 83  
Cys Pro Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Cys  
1 5 10 15

<210> 84  
<211> 25  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 84  
Cys Gly Glu Thr Tyr Lys Ser Thr Val Ser His Pro Asp Leu Pro Arg  
1 5 10 15

Glu Val Val Arg Ser Ile Ala Lys Cys  
20 25

<210> 85  
<211> 60  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<220>  
<221> MOD\_RES

<222> (18)  
<223> S, T

<220>  
<221> MOD\_RES  
<222> (21)  
<223> K, R

<220>  
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<222> (22)  
<223> G, T

<220>  
<221> MOD\_RES  
<222> (26)  
<223> H, T

<220>  
<221> MOD\_RES  
<222> (27)  
<223> K, R

<220>  
<221> MOD\_RES  
<222> (30)  
<223> G, T

<400> 85

Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Lys Glu Gly Gly Ile Ser  
1 5 10 15

Ile Xaa Glu Ile Xaa Xaa Val Ile Val Xaa Xaa Ile Glu Xaa Ile Leu  
20 25 30

Phe Gly Gly Cys Gly Gly Thr Tyr Gln Ser Arg Val Thr His Pro His  
35 40 45

Leu Pro Arg Ala Leu Met Arg Ser Thr Thr Lys Cys  
50 55 60

<210> 86  
<211> 17  
<212> PRT  
<213> Artificial Sequence

<220>

DRAFT

<223> Description of Artificial Sequence: peptide

<400> 86

Lys Trp Phe Lys Thr Asn Ala Pro Asn Gly Val Asp Glu Lys Ile Arg  
1 5 10 15

Ile

<210> 87

<211> 62

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 87

Lys Trp Phe Lys Thr Asn Ala Pro Asn Gly Val Asp Glu Lys Ile Arg  
1 5 10 15

Ile Lys Lys Lys Lys Ile Ile Thr Ile Thr Arg Ile Ile Thr Ile Ile  
20 25 30

Thr Thr Ile Asp Lys Cys Gly Glu Thr Tyr Tyr Ser Arg Val Thr His  
35 40 45

Pro His Leu Pro Lys Asp Ile Val Arg Ser Ile Ala Lys Cys  
50 55 60

<210> 88

<211> 57

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: peptide

<400> 88

Thr Ile Asn Lys Pro Lys Gly Tyr Val Gly Lys Glu Lys Lys Lys Lys  
1 5 10 15

Ile Ile Thr Ile Thr Arg Ile Ile Thr Ile Ile Thr Tyr Ile Asp Lys  
20 25 30

Cys Gly Glu Thr Tyr Tyr Ser Arg Val Thr His Pro His Leu Pro Lys

35

40

45

Asp Ile Val Arg Ser Ile Ala Lys Cys  
50 55

<210> 89  
<211> 19  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 89  
Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr Arg Leu Glu Thr  
1 5 10 15

Val Leu Phe

<210> 90  
<211> 45  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 90  
Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr Arg Leu Glu Thr  
1 5 10 15

Val Leu Phe Lys Cys Gly Glu Thr Tyr Tyr Ser Arg Val Thr His Pro  
20 25 30

His Leu Pro Lys Asp Ile Val Arg Ser Ile Ala Lys Cys  
35 40 45

<210> 91  
<211> 63  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: peptide

<400> 91

Lys Trp Phe Lys Thr Asn Ala Pro Asn Gly Val Asp Glu Lys Ile Arg  
1 5 10 15

Ile Lys Ile Ser Leu Thr Glu Ile Arg Thr Val Ile Val Thr Arg Leu  
20 25 30

Glu Thr Val Leu Phe Lys Cys Gly Glu Thr Tyr Tyr Ser Arg Val Thr  
35 40 45

His Pro His Leu Pro Lys Asp Ile Val Arg Ser Ile Ala Lys Cys  
50 55 60

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